

REMARKS

The clerical error noted by the Examiner in some of the claims is being corrected, along with some clerical errors in the specification. Applicant trusts that the objection to the claims will be withdrawn.

Claims 13 - 15 have been rejected under 35 U.S.C. §§ 102 or 103 as being anticipated by or obvious from Morrison (U.S. 4,372,856). Claim 15 is being cancelled, but reconsideration of Claims 13 and 14 is requested.

Claim 13 is being amended to distinguish over Morrison in calling for a digester having means for processing a biomass liquor in a plurality of successive phases, means for collecting gas produced by the digestive process and separating the gas into methane and carbon dioxide components, and means for feeding the methane and the carbon dioxide back to the phases in the digester to control the pH in each of the phases. This combination of elements is neither found in nor suggested by Morrison, and applicant trusts that the rejection will be withdrawn.

Claim 14 depends from Claim 13 and is directed to patentable subject matter for the same reasons as its amended parent claim. In addition, it now further distinguishes over Morrison in calling for means for individually controlling the amount of methane and the amount of carbon dioxide fed back to each of the phases.

Although the rejections have clearly been overcome by the amendments which are being made, applicant must nevertheless take exception to the Examiner's suggestion that functional language is not entitled to patentable weight in apparatus claims. In that regard, applicant would remind the Examiner that 35 U.S.C. § 112, paragraph six, expressly permits the elements of an apparatus claim to be expressed in terms of a means for performing a specified function. In the case of Claim 14, for example, one of the elements of the amended claim is "means for feeding the methane and the carbon dioxide back to the phases in the digester to control the pH in each of the phases." That is a perfectly proper means-plus-function limitation which covers means for feeding the specified gases back to the phases in the digester to control the pH in each of the phases. Controlling the pH is not a hope-for result as the Examiner seems to be suggesting, but rather a part of the specified function performed by the means.

Claims 1 - 12 have been rejected under 35 U.S.C. § 103 as being unpatentable over Dague (U.S. 5,185,079) in view of Namikoshi et al. (JP 56-156894). Reconsideration and withdrawal of that rejection is also requested.

Dague is directed to a batch processing system, and Namikoshi et al. appears to show a system in which the liquid in a tank is sprayed in fountain-like fashion into a space above the liquid and air or gas is sprayed in a downward direction toward the surface of the liquid.

Claim 1 is being amended in a manner which clearly distinguishes over the teachings of these references. As amended, it calls for a retort vessel for processing a liquor consisting essentially of a liquid and a digestible biomass, a space above the liquor in which liquid vapor and gaseous products of digestion can collect, means for maintaining a vacuum pressure in the space above the liquor, and means for introducing a pressurized feedstock into the vessel at a thermophilic temperature so that the feedstock explodes into a concentrated high pressure steam spray and fractured biomass solids that are directed onto the surface of the liquor in a manner which serves to break up any scum on the surface and produce a mixing of the fractured biomass solids and the biomass in the liquor. The explosive action is important both in breaking up the scum and in mixing the fractured biomass solids with the solids that are already in the liquor, and it is not even remotely suggested by the references.

Here again, applicant would remind the Examiner that the functional language the claim in the means-plus-function limitations is part of the means being claimed and not hoped-for results.

Claims 2 and 3 depend from Claim 1 and are directed to patentable subject matter for the same reasons as their amended parent claim. In addition, Claim 2 is being amended to further distinguish the invention in specifying that the means for introducing the feedstock includes means for introducing the feedstock into the vessel at a temperature on the order of 55°C to 100°C and a pressure on the order of at least about 250 psi. Claim 3 likewise distinguishes in defining the means for introducing the feedstock as including means for introducing the feedstock into the vessel at a pressure on the order of several hundred pounds per square inch.

Claim 4 is being amended in a manner similar to Claim 1, and it now distinguishes over the references in calling for the steps of processing a liquor

consisting essentially of a liquid and a digestible biomass in a retort vessel with a space above the liquor in which liquid vapor and gaseous products of digestion can collect, maintaining a vacuum pressure in the space above the liquor, and introducing a pressurized feedstock into the vessel so the feedstock explodes into a concentrated high pressure steam spray and fractured biomass solids that are directed onto the surface of the liquor in a manner which serves to break up any scum on the surface and produce a mixing of the fractured biomass solids and the biomass in the liquor.

Claims 5 and 6 depend from Claim 4 and are directed to patentable subject matter for the same reasons as their amended parent claim. In addition, Claim 5 further distinguishes in specifying that the feedstock is introduced into the vessel at a temperature on the order of 55°C to 100°C and a pressure on the order of at least about 250 psi. Similarly, Claim 6 specifies that the feedstock is introduced into the vessel at a pressure on the order of several hundred pounds per square inch.

Claim 7 is also being amended, and it now distinguishes over the references in calling for a retort vessel for processing a liquor consisting essentially of a liquid and a digestible biomass, and means for introducing a pressurized feedstock into the vessel so that the feedstock explodes into a concentrated high pressure steam spray and fractured biomass solids that are directed onto the surface of the liquor in a manner which serves to break up any scum on the surface and produce a mixing of the fractured biomass solids and the biomass in the liquor.

Claims 8 and 9 depend from Claim 7 and are directed to patentable subject matter for the same reasons as their amended parent claim. In addition, Claim 8 defines the means for introducing the feedstock as including means for introducing the feedstock into the vessel at a pressure on the order of several hundred pounds per square inch, and Claim 9 defines the means for introducing the feedstock as including means for introducing the feedstock into the vessel at a thermophilic temperature.

Claim 10 is being amended in a manner similar to Claim 7, and it now distinguishes over the references in calling for the steps of processing a liquor consisting essentially of a liquid and a digestible biomass in a retort vessel, and introducing a pressurized feedstock into the vessel so that the feedstock explodes into a concentrated high pressure steam spray and fractured biomass solids that are directed onto the surface of the liquor in a manner which serves to break up any scum

on the surface and produce a mixing of the fractured biomass solids and the biomass in the liquor.

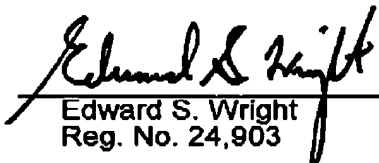
Claims 11 and 12 depend from Claim 10 and are directed to patentable subject matter for the same reasons as their amended parent claim. Claim 11 further distinguishes in specifying that the feedstock is introduced into the vessel at a pressure on the order of several hundred pounds per square inch, and Claim 12 further specifies that the feedstock is introduced into the vessel at a thermophilic temperature.

In order to more fully round out the protection to which applicant is believed to be entitled, new Claims 16 and 17 are being added. These claims are, in essence, directed to the process performed by the apparatus of Claims 13 and 14, and are directed to patentable subject matter because the process claimed therein is neither found in or suggested by the references.

With this amendment, all of the claims are believed to be directed to patentable subject matter, and the application should be in condition for allowance.

The Commissioner is authorized to charge any fees required in this matter, including extension fees, to Deposit Account 50-2975, Order No. A-70239-1.

Respectfully submitted,


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